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I also certify that the attached copy of the request for grant of a Patent (Form 1/77) bears an amendment, effected by this office, following a request by the applicant and agreed to by the Comptroller-General.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

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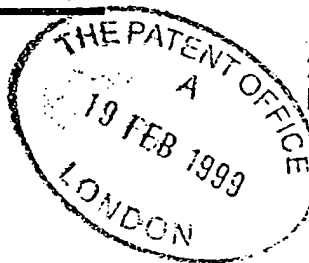
R. Mahoney

Signed

Dated 04 JUN 1999

Request for grant of a patent

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22FEB99 E427082-2 001821
F01/7700 0.00 - 9903909.1

The Patent Office

Cardiff Road
Newport
Gwent NP9 1RH

1. Your reference

JG-2428

2. Patent application number

(The Patent Office will fill in this part)

19 FEB 1999

9903909.1

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

Web Dynamics Ltd
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Rickmansworth,
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United Kingdom

United Kingdom

7369549001

4. Title of the invention

A PROCESS FOR COMBINING UNLIKE POLYMERS THROUGH
A THERMOBONDING CALENDER

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

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2097001

Patents ADP number (if you know it)

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4014 502006

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)

Date of filing
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

YES

- a) any applicant named in part 3 is not an inventor, or
 - b) there is an inventor who is not named as an applicant, or
 - c) any named applicant is a corporate body.
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Patents Form 1/77

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Continuation sheets of this form

Description

4

Claim(s)

1

Abstract

1

Drawing(s)

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

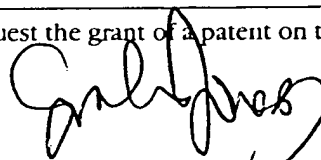
Request for substantive examination (*Patents Form 10/77*)

Any other documents
(please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature



Date

19-2-99

12. Name and daytime telephone number of person to contact in the United Kingdom Mr. G.H. Jones. 0181-858-4039

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A PROCESS FOR COMBINING UNLIKE POLYMERS
THROUGH A THERMOBONDING CALENDER

This invention relates to a process for combining unlike polymers through a thermobonding calender.

Thermobonding calenders are known and they are used to fuse together materials made of like polymers. Thus, for example, polypropylene materials such as films, meltblowns and spunbonds may be fused together by applying heat and pressure at specific bonding points. The heat and pressure melts the polymer together at each bonding point. The melting combines the different layers permanently at the bonding points, whilst leaving the layers unbonded between the bonding points. The result is a multi-layer fabric which combines excellent strength and drape characteristics.

A problem with the above mentioned thermobonding process is that the thermobonding process only fuses like polymers. The thermobonding process will not fuse layers of material made of different polymers. For example, it is not possible to fuse a polyethylene film with a polypropylene spunbond material. A general known solution to this problem is to use an adhesive lamination. Nearly all adhesive lamination processes involve an adhesive being applied to one or more substrates. During the adhesive lamination process, the materials might be heated and pressed together to form a bond and afterwards processed

through a dryer to evaporate off any solvents or carrying solutions. A problem occurs in that the adhesive lamination processes only apply adhesive to the surface of the material. As a result, the bond between different layers is only as good as the adhesion of the adhesive to the surface of any one of the component materials. By way of extreme example, it is not possible to achieve an acceptable bond between a spunbond and a meltblown using adhesives, because the surface of the meltblown has short fibres with no integral strength, and therefore the adhesive will easily peel away from the meltblown material.

It is an aim of the present invention to obviate or reduce the above mentioned problem.

Accordingly, in one non-limiting embodiment of the present invention, there is provided a process in which adhesive coated materials are passed through a thermobonding calender, thereby causing adhesive and polymer to melt together to form an integrated bond.

The adhesive coated materials may be passed through a thermobonding calender so as to set and dry the adhesive or adhesives in a single pass.

The adhesive or adhesives may be selected from the group consisting of acrylic adhesives, hot melt adhesives, netting or powder.

The discontinuous fibres may be melted to form a film at adhesive bonding points.

An embodiment of the invention will now be described for illustrative purposes only and with reference to the accompanying Example.

EXAMPLE

An adhesive was applied to one of two different materials to be bonded together. The materials with the adhesive were then passed through a thermobonding calender. This had two effects.

Firstly, the passage through the thermobonding calender heated and dried the materials as they passed through the thermobonding calender.

Secondly, and surprisingly, the system made it possible to bond a very wide range of products. For example, it was possible to achieve an acceptable adhesive bond using unlike polymers in each layer, in association with a material such as a meltblown. For example, polyethylene film bonded well to polypropylene meltblown. It was also noted that, using the same adhesive, polyethylene film achieved a better bond through the described process than through a traditional laminator.

It was noted that during the calendering part of the process, the polymers at the bonding points had melted to form a layer of thin sheets. Whilst these did not fuse, they nonetheless provided a surface onto and into which the adhesive could form a positive bond. For example, it was found that short fibre material such as meltblown had formed itself into a film at the bonding points onto and

into which the adhesive could form a positive bond. More importantly however, the adhesive had melted into the different polymers, thereby increasing the bond strength between the different layers over and above traditional adhesive bonding methods.

It is to be appreciated that the embodiment of the invention described with reference to the accompanying Example has been given for illustrative purposes only and that modifications may be effected.

CLAIMS

1. A process in which adhesive coated materials are passed through a thermobonding calender, thereby causing adhesive and polymer to melt together to form an integrated bond.
2. A process according to claim 1 in which the adhesive coated materials are passed through the thermobonding calender in order to set and dry the or each adhesive in a single pass.
3. A process according to claim 1 or claim 2 in which the adhesive is one or more of an acrylic adhesive, a hot melt adhesive, netting or powder.
4. A process according to any one of the preceding claims whereby discontinuous fibres are melted to form a film at adhesive bonding points.
5. A process for combining unlike polymers through a thermobonding calender, substantially as herein described with reference to the accompanying Example.

ABSTRACTA PROCESS FOR COMBINING UNLIKE POLYMERS
THROUGH A THERMOBONDING CALENDER

A process in which adhesive coated materials are passed through a thermobonding calender, thereby causing adhesive and polymer to melt together to form an integrated bond.